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Job No.: CQCE/BBMP/KTR/W.No.15/2018-19 Date : 27.11.2018

ATTERBERG LIMITS TEST FOR WMM
MORTH TABLE-400-11

lient : **Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
gency : **Sri. K.T. Ramesh,** Contractor, Bangalore.
ame of Work : Improvements & Reasphalting road from NH-4 to Kalasthi nagara, Nrupathunga road & sujata tent back side road in Dasarahalli ward no.15, BBMP, Bangalore.
eference : EE/DD/WO/226/2017-18 Dated: 12.02.2018
ate of Testing : 27.11.2018
aterial Type : Wet Mix Macadam

s per MORTH Table 400-13

Sl. No.	Particulars	Test Results	Standards as per Specifications
1	Liquid Limit	23.00	-
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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Job No.: CQCE/BBMP/KTR/W.No.15/2018-19 Date: 30.11.2018

TEST REPORT

Client	:	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	:	**Sri. K.T. Ramesh,** Contractor, Bangalore.
Name of the work	:	Improvements & Reasphalting road from NH-4 to Kalasthi nagara, Nrupathunga road & sujata tent back side road in Dasarahalli ward no.15, BBMP, Bangalore.
Reference	:	EE/DD/WO/226/2017-18 Dated: 12.02.2018
Source of location	:	Hot mix Plant, Bangalore
Date of testing	:	30.11.2018

The results of the tests conducted on the bitumen sample using for Bituminous Macadam

Sl. No	Description	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	64	60 to 70
2	Softening point, ^{0}C	49	Min. 45
3	Ductility at 27^{0}C, cm	100 >	Min. 50
4	Flash Point, ^{0}C	286	Min. 220

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Job No.: CQCE/BBMP/KTR/W.No.15/2018-19 30.11.2018

Aggregate Impact Value

IS: 2386 Part IV

Client	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	**Sri. K.T. Ramesh,** Contractor, Bangalore.
Name of the Work	Improvements & Reasphalting road from NH-4 to Kalasthi nagara, Nrupathunga road & sujata tent back side road in Dasarahalli ward no.15,
Reference	EE/DD/WO/226/2017-18 Dated: 12.02.2018
Source / Location	Hotmix Plant, Bangalore
Type of Mix	Bituminous Macadam
Date of Testing	30.11.2018

Sl No.	Details	Trial No. 1	Trial No. 2	Trial No. 3	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	384	386	388	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	83	85	87	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	301	301	
4	Aggregate Impact value = percent fines	21.61	22.02	22.42	
	100* (W_2/W_1)%				22.02

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Macadam is 30%

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Office & Laboratory : # 133, Bhuvaneshwarinagar, Dodda Basti Main Road, Bangalore - 560 056.
e-mail:civilqualityconsultants@gmail.com Ph: 080-23240644 / Mob: 8553518550

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Job No.: CQCE/BBMP/KTR/W.No.15/2018-19 30.11.2018

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	**Sri. K.T. Ramesh,** Contractor, Bangalore.
Name of Work	Improvements & Reasphalting road from NH-4 to Kalasthi nagara, Nrupathunga road & sujata tent back side road in Dasarahalli ward no.15, BBMP, Bangalore.
Reference	EE/DD/WO/226/2017-18 Dated: 12.02.2018
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Bituminous Macadam
Date of Testing	30.11.2018

Result : Flakiness Index = **12.19%**

Elongation Index = **13.62%**

Result : Combined Flakiness & Elongation index **25.81%**

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Job No.: CQCE/BBMP/KTR/W.No.15/2018-19 — 01.12.2018

Aggregate Gradation Test
IS : 2386 Part I

Client	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	**Sri. K.T. Ramesh,** Contractor, Bangalore.
Name of the work	Improvements & Reasphalting road from NH-4 to Kalasthi nagara, Nrupathunga road & sujata tent back side road in Dasarahalli ward no.15,
Reference	EE/DD/WO/226/2017-18 Dated: 12.02.2018
Sample ID	Hotmix Plant, Bangalore.
Type of Mix	Bituminous Macadam
Date of Testing	01.12.2018

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
26.5	0	0	0	100	100	Gradation satisfies Grade-II MORTH specification
19	354	7.08	7.08	92.92	90-100	
13.2	1648	32.96	40.04	59.96	56-88	
4.75	1726	34.52	74.56	25.44	16-36	
2.36	748	14.96	89.52	10.48	4-19	
0.3	174	3.48	93.00	7.00	2-10	
0.075	84	1.68	94.68	5.32	0-8	

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
26.5	0	0	0	100	100	Gradation satisfies Grade-II MORTH specification
19	248	4.96	4.96	95.04	90-100	
13.2	1536	30.72	35.68	64.32	56-88	
4.75	1674	33.48	69.16	30.84	16-36	
2.36	765	15.30	84.46	15.54	4-19	
0.3	542	10.84	95.30	4.70	2-10	
0.075	87	1.74	97.04	2.96	0-8	

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Job No.: CQCE/BBMP/KTR/W.No.15/2018-19

03.12.2018

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	**Sri. K.T. Ramesh,** Contractor, Bangalore.
Name of Work	Improvements & Reasphalting road from NH-4 to Kalasthi nagara, Nrupathunga road & sujata tent back side road in Dasarahalli ward no.15, BBMP, Bangalore.
Reference	EE/DD/WO/226/2017-18 Dated: 12.02.2018
Technical Reference	IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	Bituminous Concrete
Date of Testing	03.12.2018

Result : Flakiness Index = **11.37%**

Elongation Index = **14.28%**

Result : Combined Flakiness & Elongation index **25.65%**

Comments:

→ Maximum allowable Flakiness & Elongation Index for Bituminous Concrete is 30%

Note:

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CQCE/BBMP/KTR/W.No.15/2018-19 — 03.12.2018

Specific Gravity And Water Absorption Test
IS: 2386 Part III

Client	**Executive Engineer,** Dasarahalli Division, BBMP, Bangalore.
Agency	**Sri. K.T. Ramesh,** Contractor, Bangalore.
Name of the Work	Improvements & Reasphalting road from NH-4 to Kalasthi nagara, Nrupathunga road & sujata tent back side road in Dasarahalli ward no.15, BBMP, Bangalore.
Reference	EE/DD/WO/226/2017-18 Dated: 12.02.2018
Type of Mix	Bituminous Concrete
Date of Testing	03.12.2018

Sl No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2025	2021	2024	
2	Weight of basket suspended in water	W_2 g	754	756	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1271	1265	1269	
4	Weight of saturated surface dry aggregate in air	W_3 g	2018	2019	2017	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	757	756	758	
6	Weight of oven dried aggregate	W_4 g	2007	2010	2008	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.687	2.666	2.684	2.679
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.727	2.698	2.717	2.714
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.55%	0.45%	0.45%	0.48%

Comments:
→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%

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Job No.: CQCE/BBMP/KTR/W.No.15/2018-19 04.12.2018

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

CLIENT	Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
AGENCY	Sri. K.T. Ramesh, Contractor, Bangalore.
NAME OF THE WORK	Improvements & Reasphalting road from NH-4 to Kalasthi nagara, Nrupathunga road & sujata tent back side road in Dasarahalli ward no.15,
REFERENCE	EE/DD/WO/226/2017-18 Dated: 12.02.2018
DATE OF TESTING	04.12.2018

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	470	471.5
3. Weight of Asphalt and Mineral matter Extracted, g	30	28.5
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	30.5	31
7. Bitumen content in %	6.10	6.20
8. Average	6.15	

GRADATION AFTER EXTRACTION

TABLE - 1

SIEVE SIZE	Percent Passing, %		JOBMIX
mm	Sample 1	Sample 2	Gradation
19	100.0	100.0	100
13.2	94.2	96.4	79-100
9.5	82.4	84.5	70-88
4.75	61.3	63.4	53-71
2.36	50.2	52.7	42-58
1.18	40.3	38.4	34-48
0.6	32.7	34.2	26-38
0.3	21.2	23.6	18-28
0.15	14.5	16.2	12-20
0.075	6.3	8.1	4-10

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